# Chapter 3:
# Alternatives Considered

# CHAPTER 3

# ALTERNATIVES CONSIDERED

## 3.0 INTRODUCTION

The existing RCA configuration does not meet the current FAA Design Standards, as demonstrated in Tables 1-1 and 1-2. Once the new runway and taxiway systems are in place, RCA will comply with the recommended Federal standards and will be a safer public utility for both the flying public and persons on the ground. Alternatives reviewed in the 2000 RCA Master Plan Update and the 2003 ALP Narrative Report were used to develop four viable alternatives for consideration.

Relocation of the airport was considered. A review of the Master Plan Update and a quadrangle map reconnaissance (south of Hamilton to north of Victor) was conducted by the Consultant. According to the Master Plan Update approximately 200 acres of land suitable for development would be needed. Criteria such as 2% maximum grade of the terrain, drainage, utilities, avoiding populated areas, unobstructed approach and departure paths, and convenient access among others, are all necessary for a viable airport site. The Part 77 surfaces, as noted on the Airspace drawing of the Airport Layout Plan attached in Appendix V – Airport Plans and Construction, were also reviewed for possible obstruction issues. Applying these criteria to the quadrangle maps from south of Hamilton to north of Victor verifies that there are no viable sites for another airport.

The four viable alternatives evaluated as part of this Environmental Assessment are as follows:

Alternative 1 – No Action;

Alternative 2 – Relocate Runway 80 feet east;

Alternative 3 – Relocate Runway 240 feet east;

Alternative 4 – Relocate Runway 400 feet east.

## 3.1 ALTERNATIVE 1 – No Action:

This Alternative includes:

- Keeping the runway at its present length and location, and
- Not developing areas for future aviation growth.

### 3.1.1 ANALYSIS

This alternative explored the possibility of keeping the runway at its present 4,200-foot length and at the existing location. However, in its present location and configuration, RCA does not meet the FAA design standards and does not safely accommodate the current aviation needs.

The 'No Action' alternative would not provide for the needed apron and hangar space to meet projected future demand. The congestion created by existing buildings and hangars and the demand for more hangar space and taxiways would not be addressed. This would increase the potential for accidents between taxiing aircraft or with other aircraft or vehicles. With this alternative and the need for present ramp expansion, hangar development area would have to be traded in the interest of expanding the current ramp facilities. This option would not provide for the purchase of additional land to protect the airport and buffer adjacent neighborhoods.

The poor condition of taxiway, apron, and runway pavements, as explained in Appendix V, *Airport Plans and Construction*, would require Ravalli County to continually be involved in a major maintenance program. By not providing an airport that meets the recommended standards justified by current use, it is possible that the State Division of Aeronautics and the Federal Aviation Administration would not grant funds to the airport, thus leaving the task of airport development and financing up to the local sponsor, Ravalli County.

### 3.1.2 ENVIRONMENTAL IMPACTS/MITIGATION

Residential development is located just south of the present Runway 34 threshold. The 'No Action' alternative keeps the runway activity in closer proximity to the residential development, as opposed to the other alternatives. Therefore, the noise created by over-flight of aircraft over the neighborhood south of the airport would increase more than with other alternatives. Noise is the only affected environment that was determined to have a rating of "moderate" for this option. This alternative could result in increased noise levels as the airport usage increases, regardless of any improvements being made.

### 3.1.3 CONCLUSION

Alternative 1 does not provide for runway/taxiway separation and runway length for the type of aircraft forecast to use the airport during the next twenty years. Alternative 1 does not provide for the additional apron and hangar space necessary to accommodate current and future growth. Therefore, this alternative does not meet the Purpose and Need.

## 3.2 ALTERNATIVE 2 – Relocate Runway 80 Feet East:

Alternative 2 includes:

- Ultimately constructing a new 75-foot x 5,200-foot runway 80 feet east and parallel to the existing runway,
- Shifting the Runway 34 threshold 600 feet to the north,
- Removing the existing runway and lighting system,
- Relocating the existing Precision Approach Path Indicators (PAPIs), and installing new medium intensity runway lighting system,
- Acquiring 89.7 acres of land for runway, apron, taxiway, and development,
- Acquiring up to 98.8 acres of land through easement for compatible land use (65 DNL boundary outside of the minimum required land acquisition).

### 3.2.1 ANALYSIS

This alternative moves the existing runway centerline 80 feet to the east in order to meet the minimum runway/taxiway separation requirement of 240 feet. This alternative, however, would provide a runway/taxiway separation of 280 feet. The relocation of the runway 40 feet further east than required by the FAA design standards is necessary to prevent existing buildings from penetrating the Federal Aviation Regulations (FAR) Part 77 Transitional Surface. These buildings would be obstructions as defined by Part 77 if the runway was placed at 240 feet. See Drawing "ALT 2" for the identified area of no building construction and obstruction calculations.

This alternative would not require as much land for development as Alternative 3 or 4. However, 89.7 acres would still be required to the north and east for the extension and relocation of the runway.

This alternative would result in the closure of the airport due to the proximity of the construction to the existing runway. This would likely result in increased construction costs for requiring the contractor to work extended (potentially 24-hour) shifts for three to six months. The closure of the airport during construction would result in economic loss to the Hamilton area, and especially to the airport tenants who would have to close their businesses or relocate temporarily to other airports in the area.

The cost of this option is nearly the same as that of building a new runway further to the east, with increased construction costs offsetting the savings in land acquisition. However, this cost comparison does not include the economic loss to the users and tenants of the airport resulting from the temporary airport closure.

This option would not provide for the needed hangar and apron expansion possibilities since the construction of any new hangars east of the existing buildings and BRL would penetrate the transitional surface as outlined in FAR Part 77. Construction of hangars on the east side of the runway is not recommended since it could encourage the crossing of an active runway by vehicles and create a safety problem.

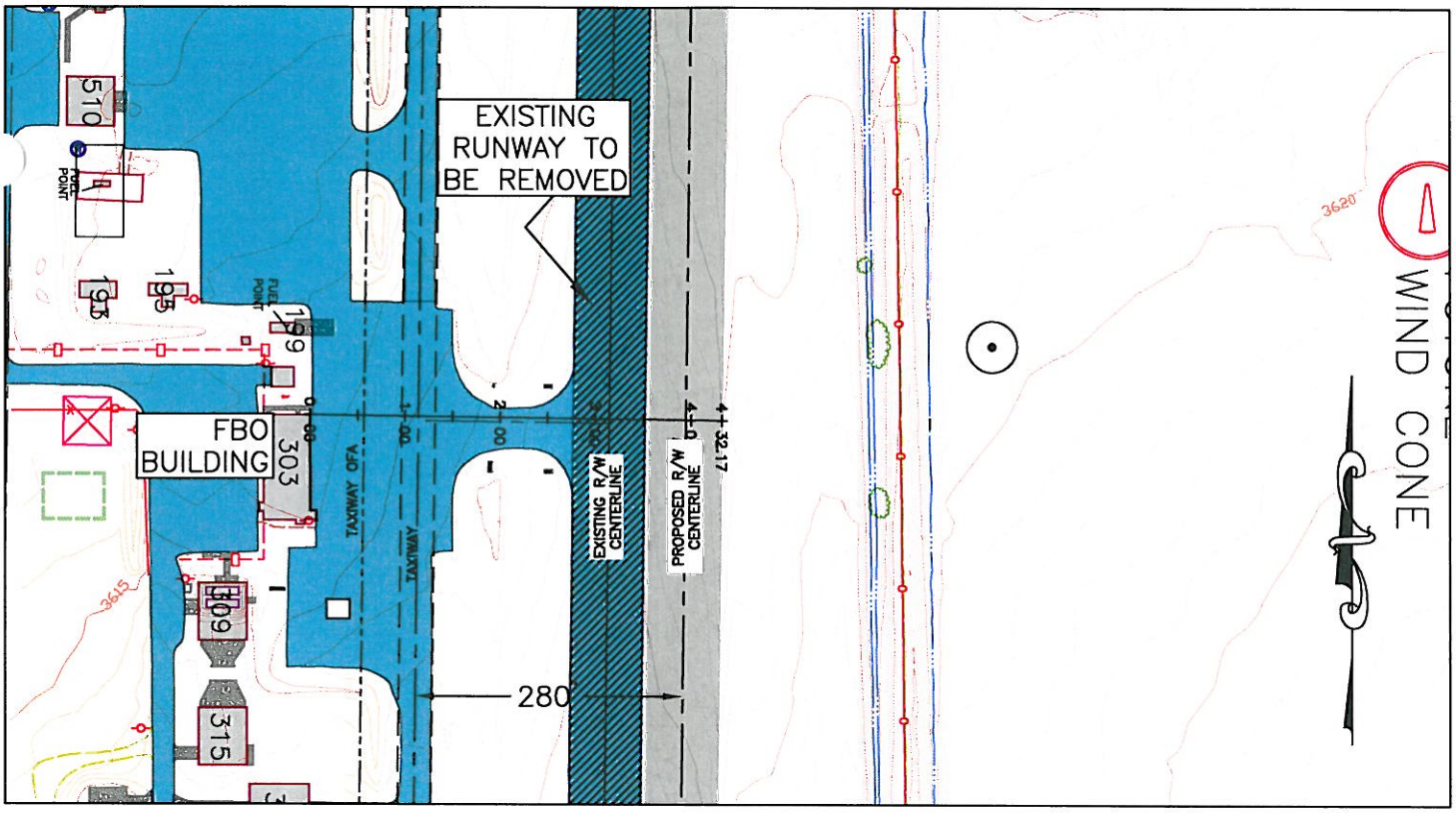
The taxiway object free area (TOFA) is an area on the ground centered on a taxiway that enhances the safety of aircraft operations by having the area free of objects, except for objects that need to be in the TOFA for air navigation or aircraft ground maneuvering purposes. The width for design group II aircraft is 115 feet, centered on the taxiway. As a result of the requirement to meet the TOFA, a limited expansion of the ramp area amounting to a 40-foot wide strip of area the length of the parallel taxiway would be provided. Much of the area is already in use in the form of existing apron and taxilanes paralleling the runway. Due to the long, narrow nature of the available space, it does not lend itself well to serving as useable apron space. As noted in Appendix IV, *Forecasts of Aviation Activity*, the existing apron is currently 16,375 square yards. Based on apron planning requirements, the apron should presently be 26,800 square yards. The present apron can be expanded to the north of its present location, but only at the expense of future hangar development area. The available space on the existing airport can be used for hangars and ramp development, but does not provide enough space for long term projection needs of both hangars and apron.

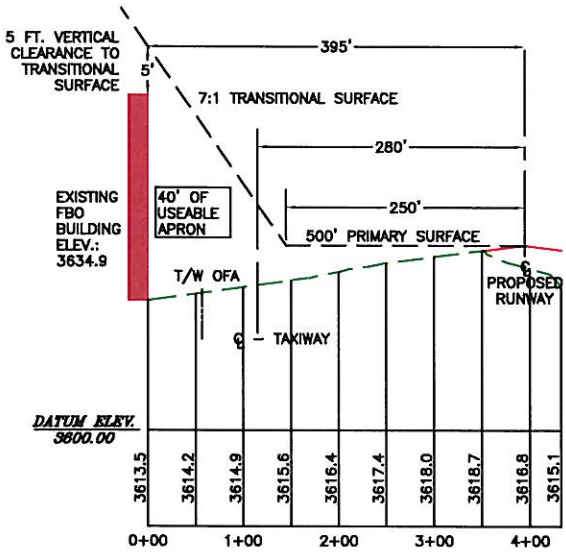
### 3.2.2 ENVIRONMENTAL IMPACTS/MITIGATION

Alternative 2 shifts the Runway 34 threshold 600' further to the north and away from Tammany Lane. Shifting of the threshold increases the height of aircraft on approach from the south over the neighborhood to the south. While this has the potential to reduce the noise over the neighborhood, noise is still an affected environment that was determined to have a rating of "moderate" for this option. This alternative could result in increased noise levels as the airport could potentially experience increased traffic volumes, regardless of what improvements may be made.

### 3.2.3 CONCLUSION

Alternative 2 meets FAA design standards for runway/taxiway separation, but does not provide the apron, taxiway, and hangar space necessary to accommodate current and future growth. Therefore, this alternative does not meet the Purpose and Need.




# ALTERNATIVE 2
## RELOCATE RUNWAY CENTERLINE 80 FEET EAST

GRAPHIC SCALE

200 0 100 200

( IN FEET )

1 inch = 200 ft.

MORRISON MAIERLE, Inc.

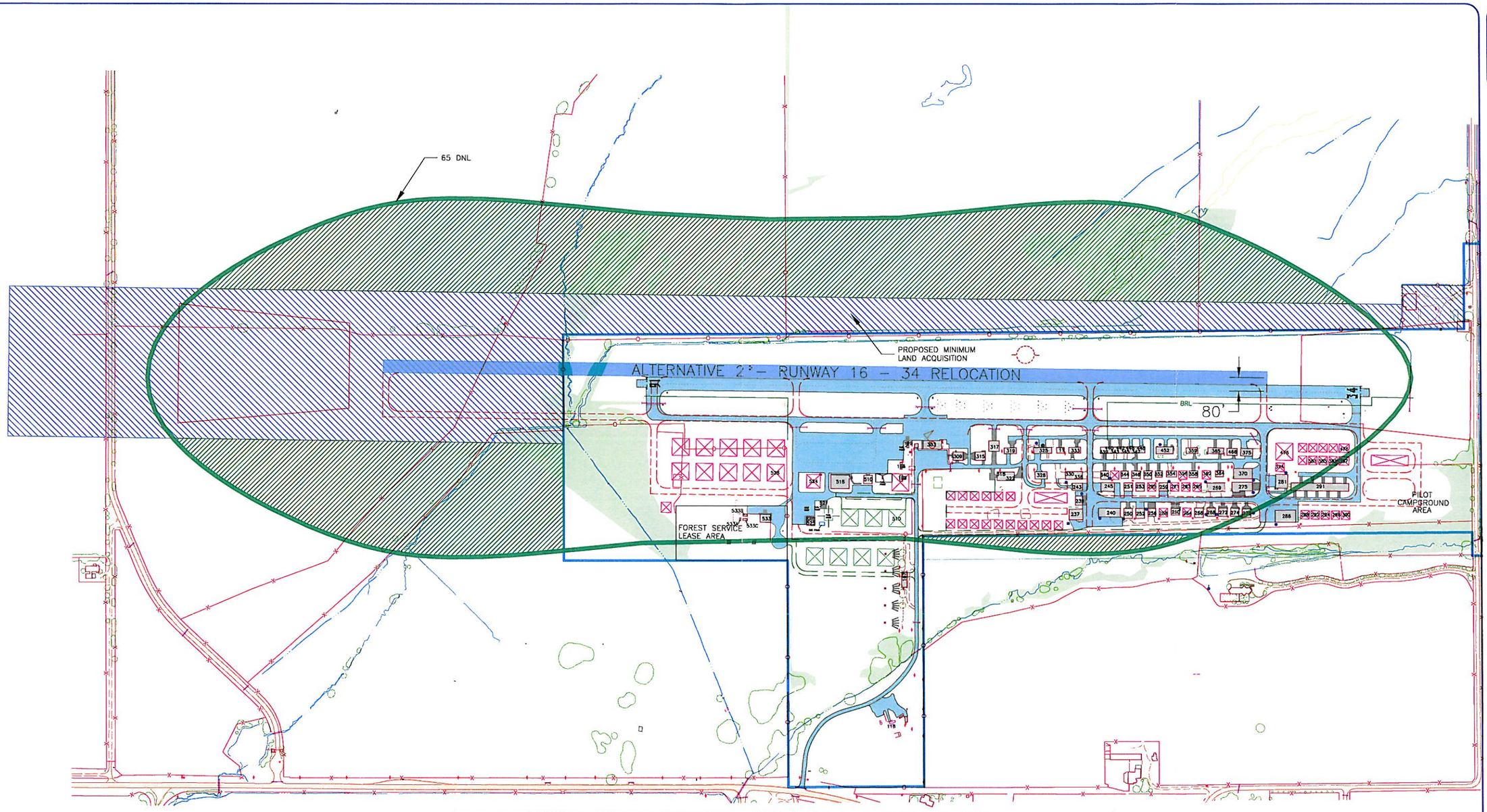
CLIENT: RAVALLI CO.

FIELD WORK:
DRAWN BY: JSD
CHECKED BY: STB

DATE: 08/10/04
SCALE: 1" = 200 '
PROJ #: 0877.

RAVALLI CO. AIRPORT EA
RELOCATE R/W 80' EAST
ALTERNATIVE 2

PLOTTED DATE: Aug/28/2006 - 10:33:49 am
DRAWING NAME:
H:\0877\EA\Exhibits\RUNWAY RELOCATION.dwg
SHEET 1 OF 3




NOTES:

1. LIMITS OF THE BUILDING RESTRICTION AREA WERE CALCULATED USING A 1% DOWN GRADIENT FROM THE EXISTING RUNWAY CENTERLINE (1% ROUGHLY MATCHES THE FALL OF EXISTING GROUND).

2. A PRIMARY SURFACE WIDTH OF 500 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA AND AREAS OF POTENTIAL APRON CONSTRUCTION.

3. A TAXIWAY OBJECT FREE AREA OF 131 FEET WAS UTILIZED IN CALCULATING AREAS OF POTENTIAL APRON CONSTRUCTION.

4. A BUILDING HEIGHT OF 21 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA ALONG THE WEST SIDE OF THE RUNWAY. A BUILDING HEIGHT OF 27 FEET WAS UTILIZED ALONG THE EAST SIDE OF THE RUNWAY TO PROVIDE FOR ADDED APPROACH/OBSTRUCTION PROTECTION.

5. LARGE RPZ UTILIZED (500 X 700 X 1000)

6. LAND ESTIMATE FOR MINIMUM REQUIRED AREA BASED ON 440 FEET EITHER SIDE OF THE PROPOSED RUNWAY CENTERLINE, EXTENDING 2200 FEET TO THE NORTH END OF THE RUNWAY. THE FAA GENERALLY PARTICIPATES IN LAND OUT TO 2000 FEET BEYOND THE END OF THE PRIMARY SURFACE FOR APPROACH PROTECTION FOR A VISUAL APPROACH.

LEGEND

| OPTION AREAS OF INTEREST | | | |
|---|---|---|---|
| THIS OPTION | | REQUIRED AREA AT 4% GROWTH TO 2030 | POTENTIAL SHORTFALL (–) OR WINDFALL (+) IN 2030 |
| EFFECTIVE FUTURE APRON EXPANSION AVAILABLE | 0 SY | 79,400 SY | – 79,400 SY |
| FUTURE BUILDING SQUARE FOOTAGE AVAILABLE * | 183,200 SF | 266,988 SF | – 83,788 SF |
| MINIMUM REQUIRED LAND ACQUISITION ** | 89.7 ACRES | | |
| COMPATIBLE LAND USE AREA *** | 98.8 ACRES | | |

* BUILDING SQUARE FOOTAGE AVAILABLE BASED ON PROPOSED BUILDING LAYOUT PRESENTED ABOVE. FUTURE BUILDINGS WITH ASSIGNED NUMBERS ARE EXISTING LEASES AND ARE NOT INCLUDED IN FUTURE AVAILABLE SF.

** MINIMUM REQUIRED LAND DOES NOT INCLUDE ALL THE 65 DNL LAND. THIS LAND MAY BE ACQUIRED THROUGH EASEMENT VERSUS FEE TITLE.

*** AREA OUTSIDE MINIMUM REQUIRED LAND ACQUISITION ENCOMPASSED BY 65 DNL.

11/2006

GRAPHIC SCALE
( IN FEET )
1 inch = 300 ft.

| LEGEND | EXISTING | FUTURE |
|---|---|---|
| PAVEMENT | | |
| BUILDING | | |
| BUILDING AFTER RW RELOCATION | | |
| AVIATION RELATED BUSINESS | | |
| FENCE | | |
| GRAVEL | | |
| AIRPORT BOUNDARY | | |
| ADJACENT PROPERTY | | |
| OFA (OBJECT FREE AREA) | OFA | OFA |
| OFZ (OBSTACLE FREE ZONE) | OFZ | OFZ |
| RPZ (RUNWAY PROTECTION ZONE) | RPZ | RPZ |
| RSA (RUNWAY SAFETY AREA) | RSA | RSA |
| BRL (BUILDING RESTRICTION LINE) | BRL | BRL |
| IRRIGATION DITCH / CREEKS | | |
| WETLANDS | | |
| CONTROL POINT | CP | |
| AIRPORT REFERENCE POINT | | |
| POTENTIAL APRON EXPANSION | | |
| AREA REQ'D MIN. LAND ACQUISITION | | |
| 65 DNL AREA OUTSIDE ALP BOUNDARY | | |

VERIFY SCALE!
THESE PRINTS MAY BE REDUCED. LINE BELOW MEASURES ONE INCH ON ORIGINAL DRAWING.
MODIFY SCALE ACCORDINGLY.

MONTANA REGISTERED PROFESSIONAL ENGINEER
SCOTT T. BELL
8123 PE

| REVISIONS | | | |
|---|---|---|---|
| NO. | DESCRIPTION | DATE | BY |


MORRISON MAIERLE, INC.
An Employee-Owned Company
ENGINEERS
SCIENTISTS
SURVEYORS
PLANNERS
SINCE 1945
2821 South Clark Street, Missoula, MT, 59801
Phone: (406) 542-8580 Fax: (406) 542-0009



| | | | |
|---|---|---|---|
| DRAWN BY: | TJE | Q.A. REVIEW | |
| CHK'D. BY: | TJE | BY: | MJM |
| APPR. BY: | STB | DATE: | |
| DATE: | 7-07 | | |

RAVALLI COUNTY AIRPORT
ENVIRONMENTAL ASSESSMENT
HAMILTON MONTANA
ALTERNATIVE 2

PROJECT NO. 0877
SHEET NUMBER ALT 2
DRAWING NUMBER ALT 2

H:\0877\EA\Exhibits\RW ALTERNATIVES-Revised1_17_08.dwg – Aug/28/2008

## 3.3 ALTERNATIVE 3 – Relocate Runway 240 Feet East:

Alternative 3 includes:

- Ultimately constructing a new 75-foot x 5,200-foot runway 240 feet east and parallel to the existing runway,
- Shifting the Runway 34 threshold 600 feet to the north,
- Relocating the PAPIs, and installing new runway lighting.
- Converting and extending the present runway to a parallel taxiway once the new runway alignment is available for use.
- Acquiring 108.2 acres of land for runway, apron, taxiway, and hangar development.
- Acquiring up to 96.0 acres of land through easement for compatible land use (65 DNL boundary outside of the minimum required land acquisition).

### 3.3.1 ANALYSIS

By moving the runway 240 feet east, the building restriction line also moves further east, which in turn, removes the existing structures and power poles from the Part 77 Transitional Surfaces. This alternative does not, however, provide the setback distance required for new hangar construction west of the existing runway and east of the existing parallel taxiway. Hangar construction in this area would penetrate the transitional surface as shown on the exhibit "Relocate Existing Runway Alternative 3" and Drawing "ALT 3." One additional hangar is able to be constructed at the south end off the parallel taxiway, as identified on Drawing "ALT 3." Modifications to the hangar layout may be able to achieve a layout that would provide for additional hangar spaces, but likely at the expense of reducing available ramp area.

This alternative also provides for the development of a sizeable apron expansion to the west of the existing runway. The 76,932 square yards identified for potential apron expansion would accommodate the airport's ramp needs for all but a projected growth rate of 4% to 2030 (79,400 square yards). While this space would be large enough to allow for flexibility in hangar location, taxilane location, and staging of apron construction, it is not the most advantageous type of layout for an apron due to the long narrow nature of the proposed area. Such a layout would reduce the ability to nest planes together in several rows and likely only provide for one row of planes to be parked wing to wing, or possibly up to one row of planes nested (wing to tail parking).

Alternative 3 could allow for the airport to remain open during the majority of the runway construction with limited runway closures or night work while connecting the new runway to the exiting runway and taxiways.

This alternative would require acquisition of 108.2 acres of land to the north and east for the extension and relocation of the runway, and 96 acres of land through easement for compatible land use.

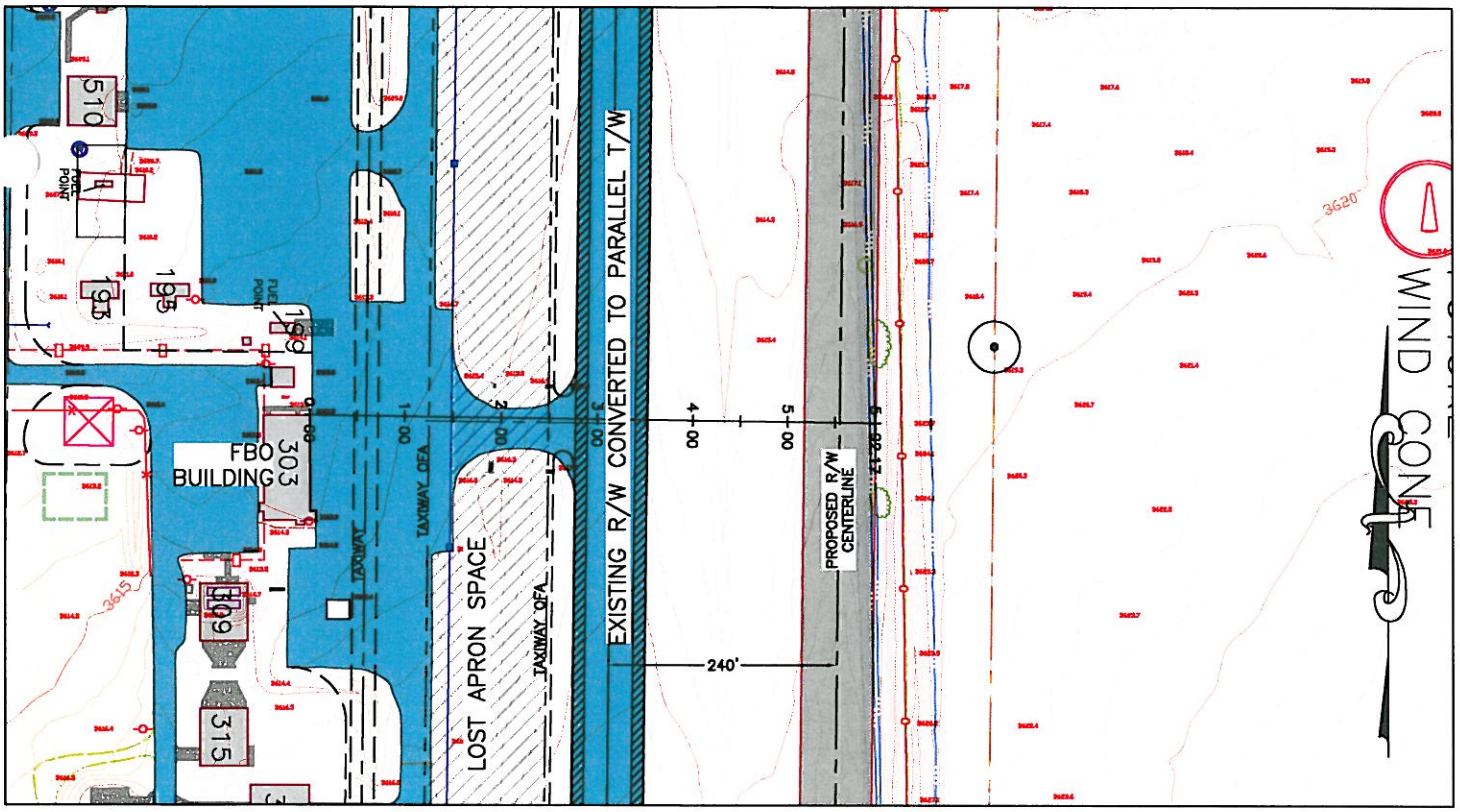
### 3.3.2 ENVIRONMENTAL IMPACTS/MITIGATION

Alternative 3 shifts the Runway 34 threshold 600' further to the north and away from Tammany Lane. Shifting of the threshold increases the height of aircraft on approach from the south over the neighborhood to the south. While this has the potential to reduce the noise over the neighborhood, noise is still an affected environment that was determined to have a rating of "moderate" for this option. This alternative could result in increased noise levels as the airport could potentially experience increased traffic volumes, regardless of what improvements may be made. Conceptual mitigation includes land acquisition of those parcels along the easterly boundary of the airport that would be impacted by noise levels beyond the acceptable threshold limits.

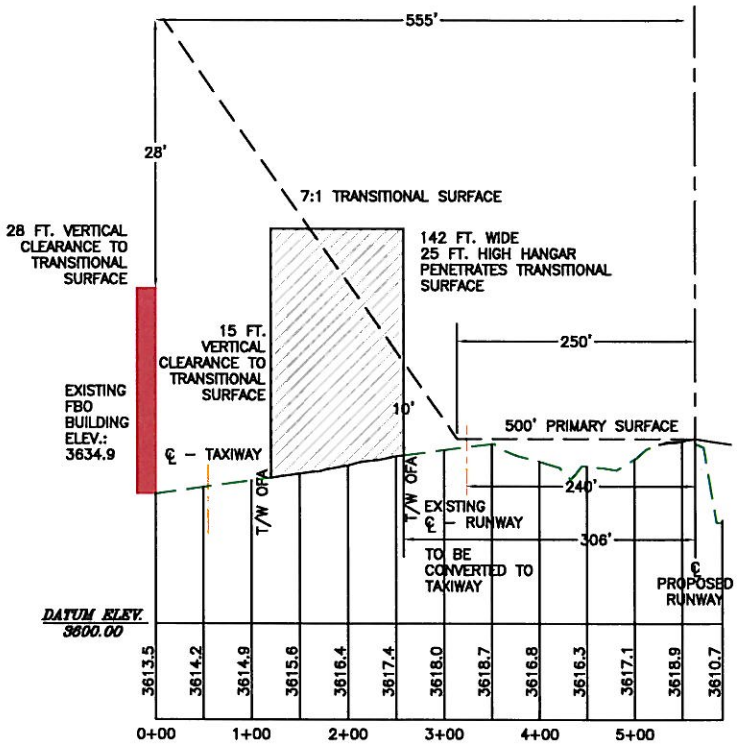
Based on wetland delineation and jurisdictional determination by the Army Corps of Engineers (COE), it was determined that the proposed improvements could impact up to 1.48 acres of wetlands. The proposed improvements would require securing an individual Clean Water Act Section 404 permit prior to project development. Securing an individual permit would require construction or acquisition of compensatory mitigation (at a ratio established by COE). An evaluation of mitigation alternatives for the project site has concluded that compensatory mitigation is available for the proposed action within the same watershed as the Airport. The project shall secure compensatory mitigation through one or more means, including the Teller Wildlife Refuge, on County-owned property, or on privately-owned property. Securing compensator mitigation will result in no adverse effect to wetland resources in the area of the Airport for the proposed action. Appendix IX – *RCA Wetland Delineation Report* can also be referenced for the wetland delineation of the Ravalli County Airport property.

### 3.3.3 CONCLUSION

Alternative 3 meets FAA design standards for runway/taxiway separation and runway length for the type of aircraft forecast to use the airport during the next twenty years. This option does not meet projected requirements for hangar and apron space in the year 2030 if a growth rate of 4% is realized. Given that the number of based aircraft at the airport in 2007 has already grown to the level that was projected for 2014, it may be prudent to provide for additional hangar area should the current growth patterns continue. Therefore, this alternative does not meet the Purpose and Need. It is not the preferred alternative due to the potential limitations for hangar development in the future.




# ALTERNATIVE 3
## RELOCATE RUNWAY CENTERLINE 240 FEET EAST




GRAPHIC SCALE

200 0 100 200

( IN FEET )

1 inch = 200 ft.

MORRISON MAIERLE, Inc.

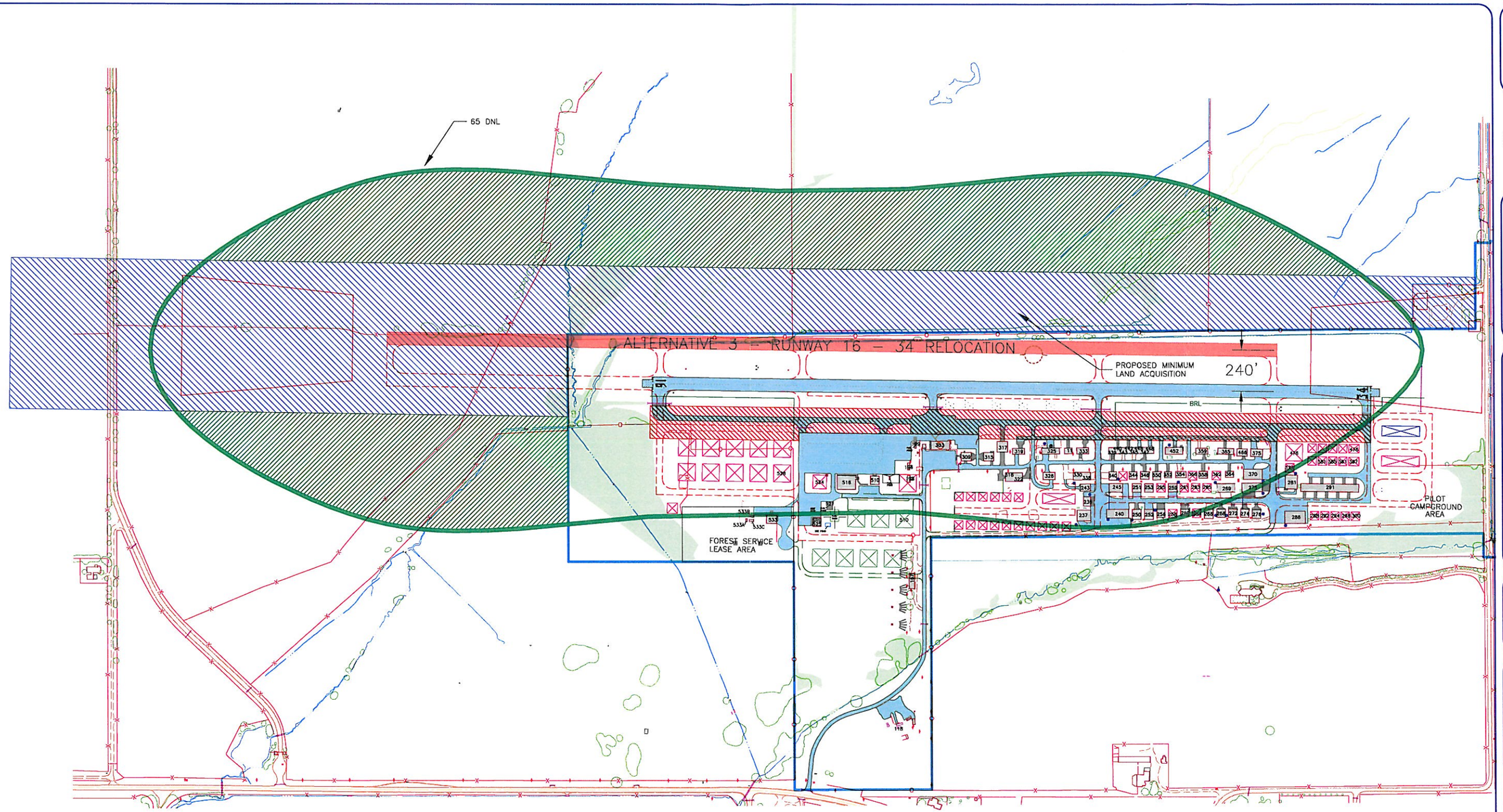
CLIENT: RAVALLI CO.

FIELD WORK:
DRAWN BY: JSD
CHECKED BY: STB

DATE: 08/10/04
SCALE: 1" = 200'
PROJ #:9877.

RAVALLI CO. AIRPORT EA
RELOCATE R/W 240' EAST
ALTERNATIVE 3

PLOTTED DATE: Aug/28/2006 - 10:34:05 am
DRAWING NAME: H:\9877\EA\Exhibits\RUNWAY RELOCATION .dwg
SHEET 2 OF 3 PLOTTED BY: Nicholson




NOTES:

1. LIMITS OF THE BUILDING RESTRICTION AREA WERE CALCULATED USING A 1% DOWN GRADIENT FROM THE EXISTING RUNWAY CENTERLINE (1% ROUGHLY MATCHES THE FALL OF EXISTING GROUND).

2. A PRIMARY SURFACE WIDTH OF 500 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA AND AREAS OF POTENTIAL APRON CONSTRUCTION.

3. A TAXIWAY OBJECT FREE AREA OF 131 FEET WAS UTILIZED IN CALCULATING AREAS OF POTENTIAL APRON CONSTRUCTION.

4. A BUILDING HEIGHT OF 21 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA ALONG THE WEST SIDE OF THE RUNWAY. A BUILDING HEIGHT OF 27 FEET WAS UTILIZED ALONG THE EAST SIDE OF THE RUNWAY TO PROVIDE FOR ADDED APPROACH/OBSTRUCTION PROTECTION.

5. LARGE RPZ UTILIZED (500 X 700 X 1000)

6. LAND ESTIMATE FOR MINIMUM REQUIRED AREA BASED ON 440 FEET EITHER SIDE OF THE PROPOSED RUNWAY CENTERLINE, EXTENDING 2200 FEET TO THE NORTH END OF THE RUNWAY. THE FAA GENERALLY PARTICIPATES IN LAND OUT TO 2000 FEET BEYOND THE END OF THE PRIMARY SURFACE FOR APPROACH PROTECTION FOR A VISUAL APPROACH.

LEGEND

| OPTION AREAS OF INTEREST | | | |
|---|---|---|---|
| THIS OPTION | | REQUIRED AREA AT 4% GROWTH TO 2030 | POTENTIAL SHORTFALL (–) OR WINDFALL (+) IN 2030 |
| EFFECTIVE FUTURE APRON EXPANSION AVAILABLE | 76,932 SY | 79,400 SY | – 2,468 SY |
| FUTURE BUILDING SQUARE FOOTAGE AVAILABLE * | 196,400 SF | 266,988 SF | – 70,588 SF |
| MINIMUM REQUIRED LAND ACQUISITION ** | 108.2 ACRES | | |
| COMPATIBLE LAND USE AREA *** | 96.0 ACRES | | |

* BUILDING SQUARE FOOTAGE AVAILABLE BASED ON PROPOSED BUILDING LAYOUT PRESENTED ABOVE. FUTURE BUILDINGS WITH ASSIGNED NUMBERS ARE EXISTING LEASES AND ARE NOT INCLUDED IN FUTURE AVAILABLE SF.

** MINIMUM REQUIRED LAND DOES NOT INCLUDE ALL THE 65 DNL LAND. THIS LAND MAY BE ACQUIRED THROUGH EASEMENT VERSUS FEE TITLE.

*** AREA OUTSIDE MINIMUM REQUIRED LAND ACQUISITION ENCOMPASSED BY 65 DNL.

11/2006

GRAPHIC SCALE
300 0 150 300
( IN FEET )
1 inch = 300 ft.

| LEGEND | EXISTING | FUTURE |
|---|---|---|
| PAVEMENT | | |
| BUILDING | | |
| BUILDING AFTER RW RELOCATION | | |
| AVIATION RELATED BUSINESS | | |
| FENCE | | |
| GRAVEL | | |
| AIRPORT BOUNDARY | | |
| ADJACENT PROPERTY | | |
| OFA (OBJECT FREE AREA) | OFA | OFA |
| OFZ (OBSTACLE FREE ZONE) | OFZ | OFZ |
| RPZ (RUNWAY PROTECTION ZONE) | RPZ | RPZ |
| RSA (RUNWAY SAFETY AREA) | RSA | RSA |
| BRL (BUILDING RESTRICTION LINE) | BRL | BRL |
| IRRIGATION DITCH / CREEKS | | |
| WETLANDS | | |
| CONTROL POINT | | CP |
| AIRPORT REFERENCE POINT | | |
| POTENTIAL APRON EXPANSION | | |
| AREA REQ'D MIN. LAND ACQUISITION | | |
| 65 DNL AREA OUTSIDE ALP BOUNDARY | | |

VERIFY SCALE!
THESE PRINTS MAY BE REDUCED. LINE BELOW MEASURES ONE INCH ON ORIGINAL DRAWING.
MODIFY SCALE ACCORDINGLY.

MONTANA REGISTERED PROFESSIONAL ENGINEER
SCOTT T. BELL
8123 PE

| REVISIONS | | | |
|---|---|---|---|
| NO. | DESCRIPTION | DATE | BY |


MORRISON MAIERLE, INC.
ENGINEERS
SCIENTISTS
SURVEYORS
PLANNERS
SINCE 1945
An Employee-Owned Company
2821 South Clark Street, Missoula, MT, 59801
Phone: (406) 542-8580 Fax: (406) 542-0009



DRAWN BY: TJE
CHK'D. BY: MJM
APPR. BY: STB
DATE: 7-07
QA REVIEW
BY:
DATE:

RAVALLI COUNTY AIRPORT
ENVIRONMENTAL ASSESSMENT
HAMILTON MONTANA
ALTERNATIVE 3

PROJECT NO.
0877
SHEET NUMBER
ALT 3
DRAWING NUMBER
ALT 3

H:\0877\EA\Exhibits\RW ALTERNATIVES-Revised1_17_08.dwg – Aug/28/2008

## 3.4 ALTERNATIVE 4 – Relocate Runway 400 Feet East:

Alternative 4 includes:

- Ultimately constructing a new 75-foot x 5,200-foot runway 400 feet east and parallel to the existing runway,
- Shifting the Runway 34 threshold 600 feet to the north,
- Relocating the PAPIs, and installing new medium intensity runway lighting system,
- Converting and extending the present runway to a parallel taxiway once the new runway alignment is available for use.
- Constructing a new area for aprons and hangars that would not penetrate the transitional surface.
- Acquiring 132.0 acres of land for runway, apron, taxiway, and hangar development.
- Acquiring up to 96.0 acres of land through easement for compatible land use (65 DNL boundary outside of the minimum required land acquisition).

### 3.4.1 ANALYSIS

A major portion of the existing runway could be used for the new parallel taxiway. This option allows for a runway protection zone to be unobstructed with an ultimate 5,200-foot runway length and a 75-foot width.

By developing a new runway 400 feet east of the existing runway as shown on the approved Airport Layout Plan instead of the 240 feet proposed in Alternative 3, the airport could gain a 230-foot wide apron for the entire front line for tie-down and hangar space. While this alternative does provide for a smaller apron area then in Alternative 3, it does provide for greater flexibility and efficiency in the possibilities for the parking of aircraft. The reduction in area for future apron expansion when comparing Alternative 3 to Alternative 4 is due to the fact that apron area available under Alternative 3 is now available for hangar development under Alternative 4. Development of this alternative would open up an additional 44% (156,175 square feet) of future building square footage based on the current hangar configuration. Of all the alternatives, Alternative 4 provides the greatest flexibility in changing hangar space to apron area or converting apron area to hangar space.

The placement of the new runway 400' east and conversion of the existing runway into the parallel taxiway will provide a safer environment for the type of aircraft now using the airport. This alternative, as well as Alternative 3, would permit the airport to remain open during the runway construction period. Maintaining the construction activity separate from active use area of the airport is an important safety issue at a busy non-towered general aviation airport.

The current design aircraft of RCA is BII. The ALP depicts an approach category "C" utilizing the airport. The 20-year projection of the use by "C" aircraft does not exceed 500 operations, thus the Purpose and Need does not reflect "C" activity. If the design

aircraft (500 operations) were to increase to an approach category "C" with an aircraft wingspan of 79 feet or greater, 400 feet of separation from the runway centerline to parallel taxiway centerline is required to meet FAA standards. Alternative 4 is the only alternative that would meet this requirement.

Alternative 4 requires the acquisition of 132.0 acres of land. The area available for additional hangar and apron space is shown on the Drawing "ALT 4".

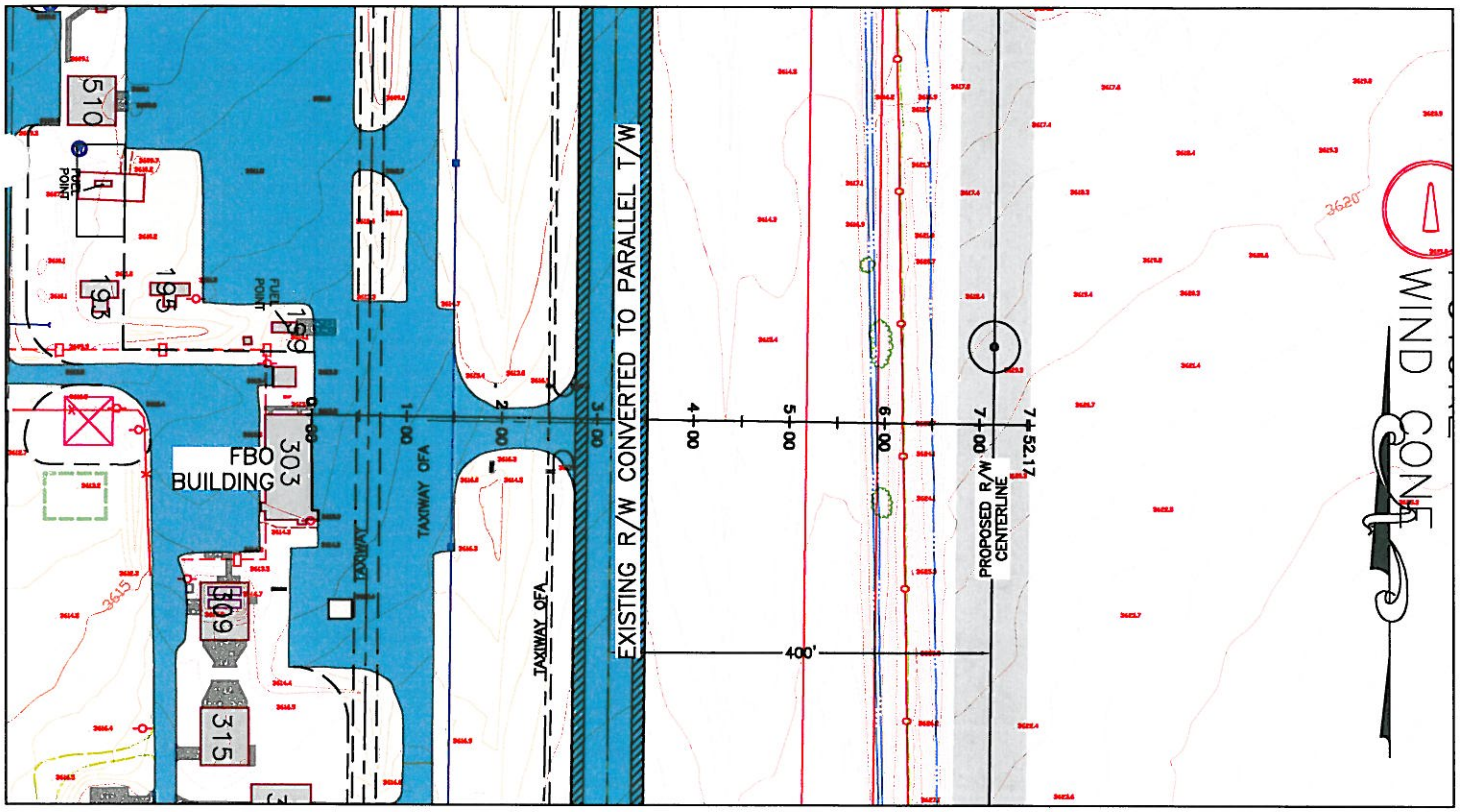
### 3.4.2 ENVIRONMENTAL IMPACTS/MITIGATION

This alternative shifts the Runway 34 threshold 600' further to the north and away from Tammany Lane. Shifting of the threshold increases the height of aircraft on approach from the south over the neighborhood to the south. While this has the potential to reduce the noise over the neighborhood, noise is still an affected environment that was determined to have a rating of "moderate" for this option. This alternative could result in increased noise levels as the airport could potentially experience increased traffic volumes, regardless of what improvements may be made. Conceptual mitigation includes land acquisition of those parcels along the easterly boundary of the airport that would be impacted by noise levels beyond the acceptable threshold limits.

Based on wetland delineation and jurisdictional determination by the Army Corps of Engineers (COE), it was determined that the proposed improvements could impact up to 1.48 acres of wetlands. The proposed improvements would require securing an individual Clean Water Act Section 404 permit prior to project development. Securing an individual permit would require construction or acquisition of compensatory mitigation (at a ratio established by COE). An evaluation of mitigation alternatives for the project site has concluded that compensatory mitigation is available for the proposed action within the same watershed as the Airport. The project shall secure compensatory mitigation through one or more means, including the Teller Wildlife Refuge, on County-owned property, or on privately-owned property. Securing compensator mitigation will result in no adverse effect to wetland resources in the area of the Airport for the proposed action. Appendix IX – *RCA Wetland Delineation Report* can also be referenced for the wetland delineation of the Ravalli County Airport property.

### 3.4.3 CONCLUSION

Alternative 4 provides for runway/taxiway separation and runway length for the type of aircraft forecast to use the airport during the next twenty years and for the additional apron and hangar space necessary to accommodate current and future growth. **Therefore, Alternative 4 meets the Purpose and Need and is considered the preferred alternative.**



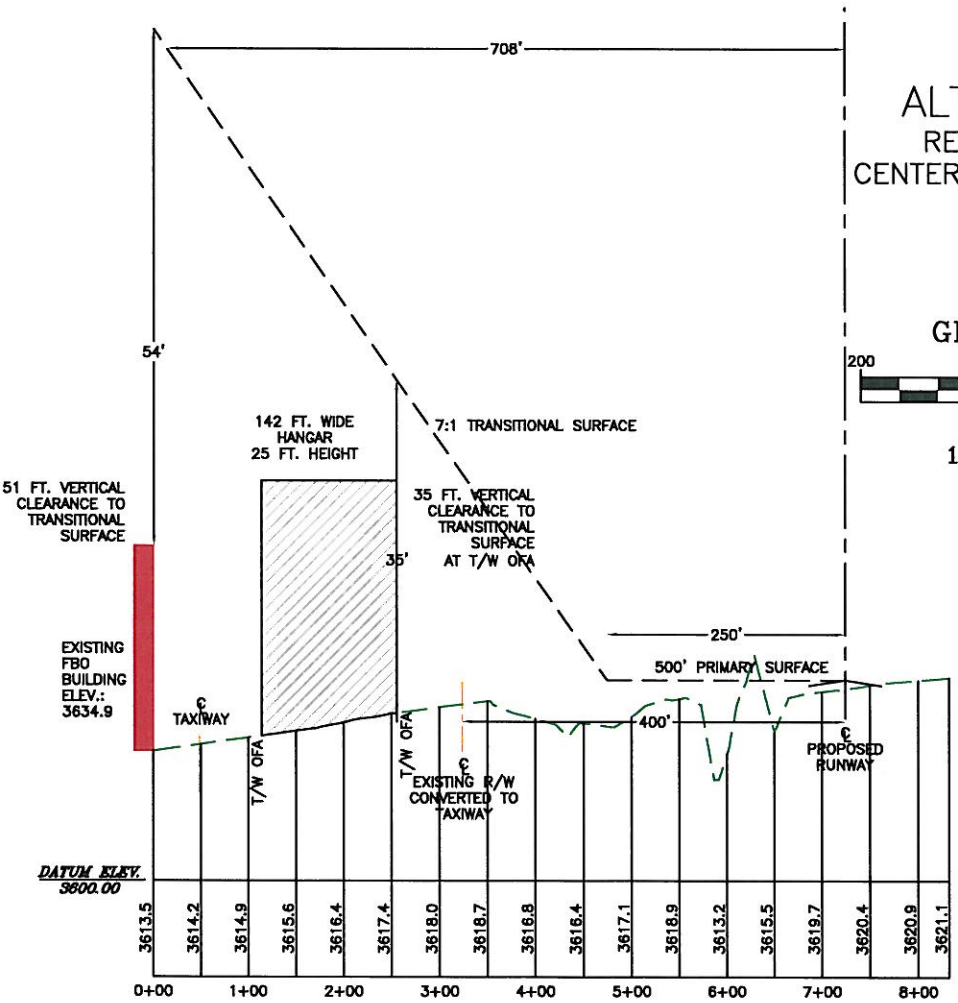

# ALTERNATIVE 4
## RELOCATE RUNWAY CENTERLINE 400 FEET EAST

GRAPHIC SCALE

200 0 100 200

( IN FEET )

1 inch = 200 ft.




MORRISON MAIERLE, Inc.

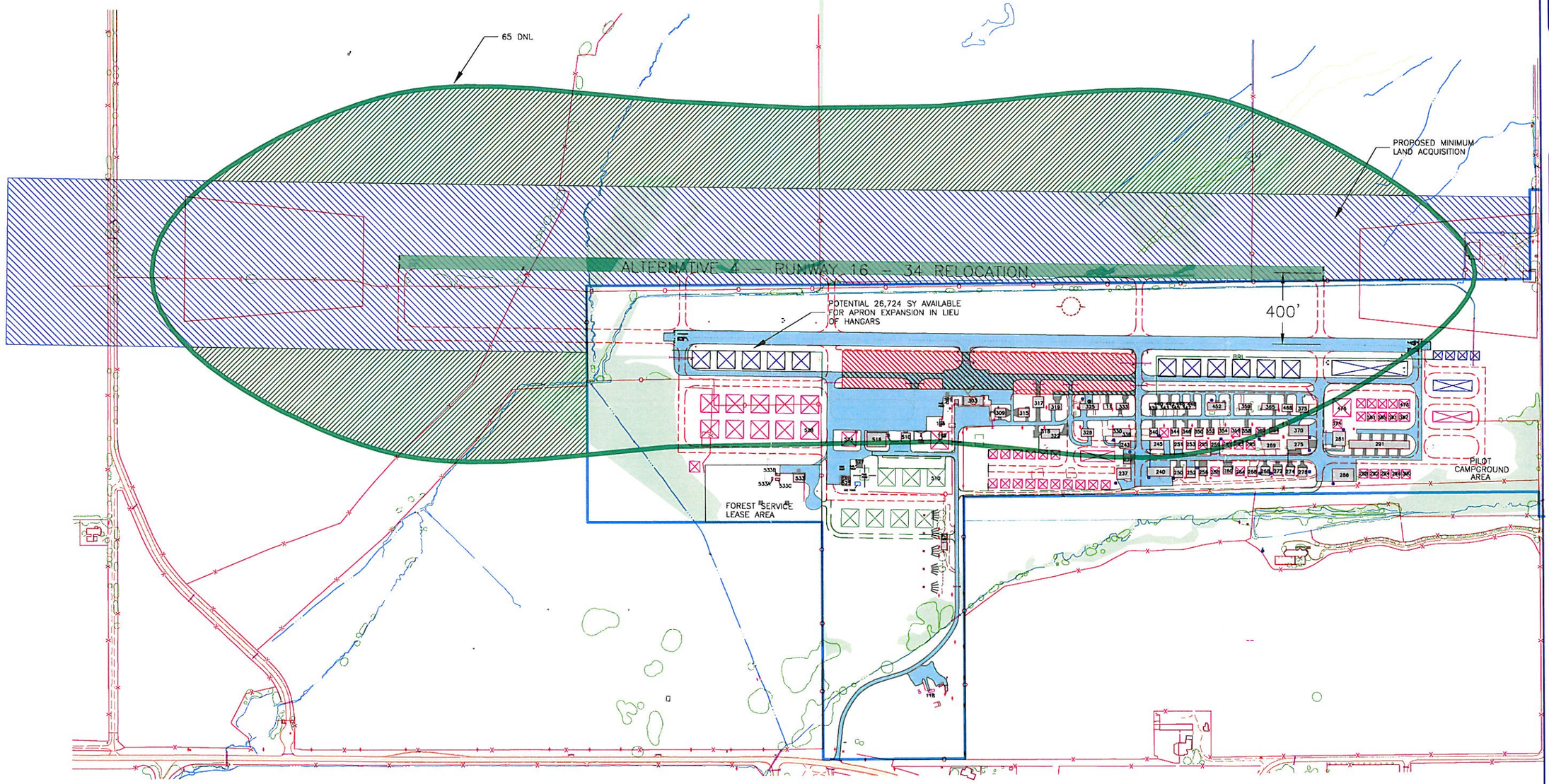
CLIENT: RAVALLI CO.

FIELD WORK:
DRAWN BY: JSD
CHECKED BY: STB

DATE: 08/10/04
SCALE: 1" = 200'
PROJ #: 0677

RAVALLI CO. AIRPORT EA
RELOCATE R/W 400' EAST
ALTERNATIVE 4

PLOTTED DATE: Aug/28/2008 - 10:34:23 am
DRAWING NAME: H:\0677\CAD\Misc\RUNWAY RELOCATION .dwg
SHEET 3 OF 3




NOTES:

1. LIMITS OF THE BUILDING RESTRICTION AREA WERE CALCULATED USING A 1% DOWN GRADIENT FROM THE EXISTING RUNWAY CENTERLINE (1% ROUGHLY MATCHES THE FALL OF EXISTING GROUND).
2. A PRIMARY SURFACE WIDTH OF 500 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA AND AREAS OF POTENTIAL APRON CONSTRUCTION.
3. A TAXIWAY OBJECT FREE AREA OF 131 FEET WAS UTILIZED IN CALCULATING AREAS OF POTENTIAL APRON CONSTRUCTION.
4. A BUILDING HEIGHT OF 21 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA ALONG THE WEST SIDE OF THE RUNWAY. A BUILDING HEIGHT OF 27 FEET WAS UTILIZED ALONG THE EAST SIDE OF THE RUNWAY TO PROVIDE FOR ADDED APPROACH/OBSTRUCTION PROTECTION.
5. LARGE RPZ UTILIZED (500 X 700 X 1000)
6. LAND ESTIMATE FOR MINIMUM REQUIRED AREA BASED ON 440 FEET EITHER SIDE OF THE PROPOSED RUNWAY CENTERLINE, EXTENDING 2200 FEET TO THE NORTH END OF THE RUNWAY. THE FAA GENERALLY PARTICIPATES IN LAND OUT TO 2000 FEET BEYOND THE END OF THE PRIMARY SURFACE FOR APPROACH PROTECTION FOR A VISUAL APPROACH.

LEGEND

| OPTION AREAS OF INTEREST | | | |
|---|---|---|---|
| THIS OPTION | | REQUIRED AREA AT 4% GROWTH TO 2030 | POTENTIAL SHORTFALL (–) OR WINDFALL (+) IN 2030 |
| EFFECTIVE FUTURE APRON EXPANSION AVAILABLE | 39,656 SY | 79,400 SY | – 39,744 SY |
| FUTURE BUILDING SQUARE FOOTAGE AVAILABLE * | 352,575 SF | 266,988 SF | + 85,587 SF |
| MINIMUM REQUIRED LAND ACQUISITION ** | 132.0 ACRES | | |
| COMPATIBLE LAND USE AREA *** | 96.0 ACRES | | |

* BUILDING SQUARE FOOTAGE AVAILABLE BASED ON PROPOSED BUILDING LAYOUT PRESENTED ABOVE. FUTURE BUILDINGS WITH ASSIGNED NUMBERS ARE EXISTING LEASES AND ARE NOT INCLUDED IN FUTURE AVAILABLE SF.

** MINIMUM REQUIRED LAND DOES NOT INCLUDE ALL THE 65 DNL LAND. THIS LAND MAY BE ACQUIRED THROUGH EASEMENT VERSUS FEE TITLE.

*** AREA OUTSIDE MINIMUM REQUIRED LAND ACQUISITION ENCOMPASSED BY 65 DNL.

11/2006

GRAPHIC SCALE
300 0 150 300
( IN FEET )
1 inch = 300 ft.

| LEGEND | EXISTING | FUTURE |
|---|---|---|
| PAVEMENT | | |
| BUILDING | | |
| BUILDING AFTER RW RELOCATION | | |
| AVIATION RELATED BUSINESS | | |
| FENCE | | |
| GRAVEL | | |
| AIRPORT BOUNDARY | | |
| ADJACENT PROPERTY | | |
| OFA (OBJECT FREE AREA) | OFA | OFA |
| OFZ (OBSTACLE FREE ZONE) | OFZ | OFZ |
| RPZ (RUNWAY PROTECTION ZONE) | RPZ | RPZ |
| RSA (RUNWAY SAFETY AREA) | RSA | RSA |
| BRL (BUILDING RESTRICTION LINE) | BRL | BRL |
| IRRIGATION DITCH / CREEKS | | |
| WETLANDS | | |
| CONTROL POINT | | CP |
| AIRPORT REFERENCE POINT | | |
| POTENTIAL APRON EXPANSION | | |
| AREA REQ'D MIN. LAND ACQUISITION | | |
| 65 DNL AREA OUTSIDE ALP BOUNDARY | | |

VERIFY SCALE!
THESE PRINTS MAY BE REDUCED. LINE BELOW MEASURES ONE INCH ON ORIGINAL DRAWING.
MODIFY SCALE ACCORDINGLY.

MONTANA REGISTERED PROFESSIONAL
SCOTT T. BELL
8123 PE

REVISIONS

| NO. | DESCRIPTION | DATE | BY |
|---|---|---|---|


MORRISON MAIERLE, INC.
An Employee-Owned Company
ENGINEERS SCIENTISTS SURVEYORS PLANNERS
SINCE 1945
2821 South Clark Street Missoula, MT, 59801
Phone: (406) 542-8880 Fax: (406) 542-0009
COPYRIGHT © MORRISON MAIERLE, INC., 2000


DRAWN BY: TJE
CHK'D. BY: MJM
APPR. BY: STB
DATE: 7-07
Q.A. REVIEW
BY:
DATE:

RAVALLI COUNTY AIRPORT
ENVIRONMENTAL ASSESSMENT
HAMILTON MONTANA
ALTERNATIVE 4

PROJECT NO. 0877
SHEET NUMBER ALT 4
DRAWING NUMBER ALT 4

H:\0877\EA Exhibits\RW ALTERNATIVES-Revised1_17_08.dwg – Aug/28/2008